

# PROMPT-BASED MUSIC DISCOVERY: A PROTOTYPE USING SOURCE SEPARATION & LLMS



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## MOTIVATION

- Current recommender systems work well for broad discovery
- But users lack a voice beyond likes and clicks; no way to ask for exactly what they want

## NATURAL LANGUAGE QUERIES

- Llama-3.3-70B<sup>5</sup> (Groq) → SQL query
- Validation ensures read-only access
- Returns Top 5 results ranked by listener count

## DATASET & PREPROCESSING

- 604 tracks from Free Music Archive<sup>1</sup>
- 8 genres: Blues, Jazz, Rock, Soul/R&B, Pop, Hip-Hop, Folk, Country
- Metadata scraped via BeautifulSoup<sup>2</sup> → stored in SQLite

## LIMITATIONS

- Limited feature/instrument recognition
- Simplistic RMS presence detection
- Small dataset (604 tracks)
- Query accuracy not systematically measured

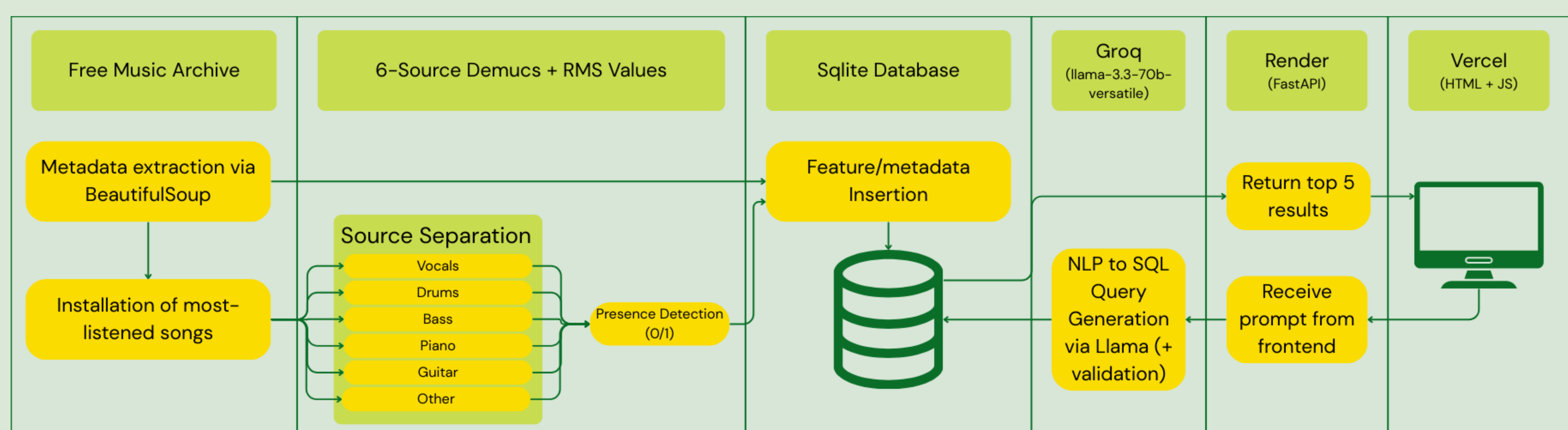
## SOURCE SEPARATION & FEATURES

- Demucs<sup>3,4</sup> (6-source) → Vocals, Drums, Bass, Piano, Guitar, Other
- RMS threshold → binary instrument presence (0/1)
- Inserted into database as features

## FUTURE DIRECTIONS

- Richer features: chords, key, tempo
- Beyond binary: confidence + temporal segmentation
- Better NL2SQL<sup>6</sup> and source separators<sup>7</sup>
- Larger datasets + user studies

## PIPELINE



## REFERENCES



## DEMO



## CONNECT

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